Production of Hypocholesterolemic Agent by Monascus pilosus in Solid-Liquid Culture

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ABSTRACT

In this study, monacolin K was produced by Monascus pilosus CCRC 31527 in solid-liquid culture. Several different strategies of manipulating variables, such as culture temperature, initial pH and volume of medium, carbon and nitrogen source, were investigated. It was found that the optimum culture temperature was between 25 °C and 30 °C. The optimum media in the culture of 25 °C were found to be pH 8.0 and 25 ml; while those in the culture of 30 °C were to be pH 5.0 and 125 ml. Furthermore, rice powder was considered to be the best carbon source in giving the maximum yield of monacolin K. The maximum yield was 7.178(10^-3 mg/ml in the culture of 25 °C. The appropriate organic nitrogen source was changed with the culture temperature. Among the nitrogen sources tested, yeast extract and peptone were found to be suitable for monacolin K production in the culture of 25 °C and 30 °C, respectively. This research demonstrated that the solid-liquid culture was worth improving the yield of monacolin K. Response surface methodology was used to optimise monacolin K production by M. pilosus CCRC 31527 in flask culture. Analysis of variance indicated that the interaction between operation variables (yeast extract and glycerin) in the quadratic model was only significant. The concentration of yeast extract at the design center point was recommended to be at 0.5 g/L, while the concentration of glycerin was at 120 ml/L and the concentrations of both rice starch and glucose were 30 g/L. For this kind of complex medium, it would be good for monacolin K production by M. pilosus CCRC 31527.

Keywords: 紅麴菌 ; 回應曲面法 ; 固液態培養 ; 膽固醇合成抑制劑

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